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The Social Context of Earnings, Employment, and Satisfaction

Establishing Frameworks of Contentment: Income Satisfaction in Germany, 1991*

By Lawrence E. Hazelrigg** and Melissa A. Hardy***

Summary

Using data from the 1992 wave of the German Socio-Economic Panel Study (GSOEP), we estimate models of satisfaction with household income, expressed as functions of personal and household status variables, including size of household income, and unobserved variables. The income effect is specified alternately as exogenous and endogenous. Results support the endogenous specification. Satisfaction is sensitive to relative standing as well as to absolute level of income. The size of the income effect diminishes rapidly as income level increases.

1. Introduction

Assessments of well-being involve an equilibration between „resources” and „needs.” Commonsense understandings of such assessments usually assume exogeneity of the relationship. There are good reasons of theory, and some empirical evidence, to doubt that assumption. A substantial and varied literature argues that (1) evaluations of the fit between „need” and „need-satisfying resource” are made within a framework of mutual relativity, such that „need” is perceived relative to perceptions of „relevant resource,” and vice versa; (2) the evaluative framework incorporates expectations about present self and future self based on intrapersonal referencing (e.g., „How am I doing today, relative to yesterday?” „Given my conditions today, what are my prospects for tomorrow?”) and/or on interpersonal referencing (e.g., „How am I doing relative to Person P?”); and (3) expectation states (e.g., the behavioral expectations of present self with regard to future self and with regard to present and future others) and evaluations of self and others in regard to conditions, abilities, resources, and reward structures are sensitive to status characteristics of present self (e.g., Glatzer 1991; Glatzer and Zapf 1987;

Hazelrigg and Hardy 1997; Kahneman and Snell 1990; van de Stadt, Kapteyn, and van de Geer 1985; van Praag 1993).

Our approach in the present study of household income and satisfaction with that income is organized around a relatively simple model. As a first hypothesis, let satisfaction be a function of the observed value of household income, a vector of other observed status characteristics (age, gender, education, employment status, etc.), and unobserved factors. If income is exogenous to income satisfaction, this hypothesis is logically sound. But if in fact income and income satisfaction are jointly determined, the correlation between observed income and those unobserved factors will be nonzero. In response, one can instrumentalize the term for income-i.e., generate a distribution of fitted values for income, on the basis of a model of income determination (see, e.g., Greene 1993, pp. 601-605). Moreover, the distribution of residuals from the fitted income function can be interpreted as an index of relative standing, by the following argument. Assume that adults' implicit theories of income determination approximate the model of income determination. Anyone doing better (worse) than the income implied by characteristics used to generate the fitted values should be self-described as „above average” („below average”) in relative standing. Thus, the satisfaction model that uses an instrumentalized income variable can be augmented by this „residuals” measure of relative standing. As a test of the underlying assumption, another conceptually more direct measure of relative standing (e.g., a question asking respondents to evaluate their relative standing in terms of income) can be added to the model, the hypothesis being that the coefficient for the residual measure should then tend to zero.

* This paper is an abbreviated version of the larger conference paper which reported multiple analyses using the GSOEP for Germany and the General Social Survey for the United States. Comments by Hartmut Esser, Joachim Frick, Maria Engracia Rochina-Barrachina, and Arthur van Soest will be incorporated in a revision of that larger paper, to be published elsewhere.

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2. Methods of Study

Analyses reported below are based on personal and household observations from the 1992 wave of the German Socio-Economic Panel Study (GSOEP). Some demographic information from 1993 and 1994 was merged into the data file in order to minimize missing-data problems. The working sample was defined as nonimmigrant household heads reporting information on satisfaction with household income. Parallel analyses were conducted with data from the 1991 and 1993 cross-sections of the U.S. General Social Survey. Because results of the latter analyses mirrored those for the GSOEP data, only the GSOEP results are shown.

GSOEP respondents were asked to self-assess satisfaction by choosing a number ranging from 0 (least satisfied) to 10 (most satisfied). The response distribution has a mean score of slightly more than 6. Since the GSOEP scale does not necessarily meet the standard ordinary least squares (OLS) assumption of a continuous metric (strictly speaking, the governing issue is not simply the sequence of integers on a number line but the potentially variable semantic mapping made by respondents onto that number line), we duplicated the OLS estimations reported below, using ordered probit, which assumes only ordinality. Basic conclusions were unchanged. The ordered-probit estimations also allowed a test of the OLS assumption of equal intervals on the satisfaction scale. There was some tendency toward longer intervals at the upper end of the scale, but in general, the intervals varied only modestly and fit the OLS assumption quite well.

Observed income, defined as total net household income per month, was converted to an annual basis and then transformed to natural log. Income was instrumentalized by age, age squared, gender, years of school, marital status, employment status, occupational prestige, and a dummy variable for the federal states of the former East Germany. The last variable was the identifier; although its zero-order correlation with satisfaction is nonzero, controls for compositional differences readily drive the correlation to zero. The adjusted R^2 for the fitted income equation was 0.50 ($N = 5,094$). The fitted distribution was more compact than the observed distribution: the maximum and minimum logged values for the instrument (versus the log of the observed maximum and minimum) were 11.4 (vs. 12.4) and 9.4 (vs. 8.0). Diagnostic tests on the instrumentation were reassuring. First, plots of the residuals from the fitted income function (which correlated with observed income at $r = 0.68$) showed them to be regular in shape. Second, residual distributions from predicted satisfaction, using first the log of observed income and then the income instrument, correlated at $r = 0.99$, which is reassuring since there is no reason to expect that the unobserved predictors of satisfaction should differ as a result of the instrumentation of income.

Other status variables (named in Table 1) are generally straightforward in design. Unfortunately, there are no ready

observations on years of school for respondents in the former East German states, and there are a few cases of missing educational data in the western states as well. In order to retain all these cases (which usually had information on all other variables), we created a dummy variable, *school not missing*, coded 1 when the observation was available for a particular respondent, and included that dummy variable in the regression along with *years of school* (Cohen and Cohen 1983, pp. 274-79). Basically the same technique was also used for occupational prestige (Treiman scores), except that in this case the relevant dummy variable, current employment status (employed = 1), was already included in the analysis.

Our effort to test the effect of relative standing on satisfaction with household income utilized two different measures of relative standing. The first is the residuals measure, as described above. The second is a measure similar to the welfare function of income index used in related research (e.g., Kapteyn, van de Geer, and van de Stadt 1985; van de Stadt, Kapteyn, and Van de Geer 1985; van Praag 1993) and interpretable as manifesting a comparative reference framework of perceived income distributions. GSOEP respondents were asked to estimate the amount of income that best fit each of six verbal descriptors: very low, low, still insufficient, just enough, good, and very good. Using that respondent-defined set of equivalencies in a perceived income distribution, we assigned to the respondent's own household income the most appropriate verbal descriptor, our assumption being that the choice of descriptor reflected the respondent's (implicit) evaluative perception of own-relative-to-other household income. Because of missing data on the descriptor question, matches could be constructed for only 3,412 households. Given the size of the missing-data problem, we used here, too, a dummy-variable specification of missing data in the relevant portion of the main analyses. (Household income was the only significant net predictor in a probit model predicting missing data on evaluated income.) Hardly any of the respondents for whom matches could be constructed described their own household incomes as less than „just enough.” Thus, when using the evaluated income variable in the analyses, we collapsed those few respondents into one category, labeled *not adequate*, and treated the „just enough” response as reference category (*adequate*), with the distinctions of good and very good maintained.

3. Main Results of Analyses

As previously noted, the basic analyses were repeated with national data for the United States. For each country, duplicate analyses were conducted, using OLS and ordered probit estimation models. And in view of the missing-data problem on education for respondents in the eastern states (the old East Germany), analyses of the GSOEP data were repeated still again for only the western states. The basic results were quite consistent across coun-

Table 1

**Predicting Satisfaction with Financial Situation among
Heads of Household in Germany, 1991**
(N = 5,078)

	1	2	3	4
Constant	-14.486** (0.642)	14.764* (4.648)	14.055* (4.302)	13.991* (4.216)
Female	0.152 (0.068)	0.035 (0.075)	0.029 (0.070)	0.051 (0.068)
Years of school	0.015 (0.014)	0.140** (0.024)	0.129** (0.022)	0.120** (0.022)
School not missing	0.685** (0.170)	0.371 (0.187)	0.454* (0.173)	0.469* (0.170)
Single	0.267* (0.102)	-0.885** (0.247)	-1.109** (0.229)	-0.991** (0.224)
Divorced/Separated	-0.675** (0.106)	-1.634** (0.228)	-1.904** (0.211)	-1.740** (0.207)
Widowed	0.1137 (0.105)	-0.786** (0.248)	-1.240** (0.230)	-1.096** (0.226)
Employed	0.287 (0.156)	0.602** (0.176)	0.607** (0.163)	0.540** (0.160)
Occupational prestige	0.001 (0.003)	0.022** (0.005)	0.022** (0.004)	0.020** (0.004)
Household income	0.808** (0.065)	-1.190* (0.464)	-1.043 (0.430)	-1.023 (0.421)
Residuals	—	—	1.869** (0.065)	1.611** (0.067)
Evaluated income not adequate	—	—	—	-0.322 (0.318)
good	—	—	—	0.568** (0.083)
very good	—	—	—	0.497** (0.096)
not missing	—	—	—	0.429** (0.064)
Adjusted R ²	0.34	0.24	0.35	0.37

^{a)} In column 1, Household income is log transform of observed metric; in remaining columns, the income instrument. Other variables in the equations include age, household size, and dummies for health status and home ownership. The reference category for Evaluated income is „adequate.” Standard errors are in parentheses. — * p<0.01. — ** p<0.001.
Source: Author's calculations using GSOEP 1992 wave.

tries and across estimation models. Therefore, we concentrate on the OLS estimations from the GSOEP data for Germany as a whole.

The first comparison of interest is between columns 1 and 2, which differ only in the treatment of household income (the log of observed household income in column 1; the predicted log of household income in column 2 as well as in columns 3 and 4). Comparisons between columns can be summarized in three categories: (1) coefficients that are consistent in sign, magnitude, and precision; (2) coefficients that are consistent in sign and precision but differ in

magnitude; and (3) coefficients that differ most notably. The net effects of age, health, home ownership, and household size fall into the first category: older, healthier homeowners with smaller families are more satisfied with their financial situation, on average, and the relationships hold regardless of the way the income effect is modeled. (Coefficients for those variables are not shown in the table, in order to conserve page space.) The second category includes the net effects of employment status and occupational prestige; the coefficients are consistent in sign across columns, but once the endogeneity of income is managed through

instrumentation the magnitude of each of the two net effects is enhanced. The third category contains the remaining status effects. One is an apparent difference by gender of household head. Female heads of household appear to be more satisfied than male heads, but once observed income is replaced with predicted income the gender difference disappears. Likewise, the relative satisfaction of household heads in various marital statuses is sensitive to the assumption of income exogeneity. Whereas the comparison of married respondents to those of other marital statuses is mixed in column 1, once income endogeneity is allowed (column 2) it becomes clear that satisfaction is consistently higher among married than among single, divorced/separated, or widowed respondents.

Switching from the assumption of exogeneity to endogeneity alters not only the estimated net effects of status variables as just described, it also significantly alters the estimation of the income effect. Bear in mind that, because income is in logarithmic metric, the effect of income increments on satisfaction is largest at the lower end of the income distribution. When the log of *observed* income is entered in the model, the net effect is positive and declining in magnitude at an accelerating rate. When the log of *predicted* income (i.e., the income instrument) is entered instead, the sign of the income effect switches to negative: controlling for the other variables in the model and for the (assumed) fact that satisfaction and income are jointly determined, higher levels of satisfaction are linked to lower levels of household income.

Modeling the income effect as in columns 1 and 2 assumes that satisfaction is largely a function of absolute standards: once a specific income threshold is passed, a respondent tends to become more satisfied regardless of other factors (other status characteristics, cognitive characteristics, etc.). Modeling the income effect as in columns 3 and 4 assumes rather that financial satisfaction is sensitive to determinants of *relative* income *within* status groups. Estimations reported in columns 3 and 4 are consistent with this latter argument.

The pattern of effects for status variables included in columns 1 and 2 is reproduced in columns 3 and 4, to which measures of relative financial status have been added. In column 3 the measure of relative standing is based on the income instrument. Respondents whose household incomes exceeded the level of income predicted for household heads having their characteristics were more satisfied with their financial situations. This finding is consistent with the argument that, when evaluating their situations, respondents invoked a comparative framework, assessing their situations relative to similarly situated reference groups and in terms of a relatively consistent set of normative expectations about income determination.

Column 4 adds the dummy variables for evaluated income. Respondents whose household incomes placed them (by their own constructions) in the good or very good income categories were higher in financial satisfaction, net

of other factors, than the respondents whose household incomes placed them in the adequate category. The more important point for present purposes, however, is that adding the evaluated income measure did reduce the coefficient for the residual measure of relative standing, which is what one would expect on the argument that the residuals of the income instrumentation are indeed a measure of perceived relative standing.

4. Discussion

Our central claim has been that financial satisfaction and household income are jointly determined outcomes, contingent on personalized social frameworks of contentment which shape both the motivated choices that people make and the way those choices are evaluated. Our estimations consistently indicate that income and satisfaction are correlated net of other factors. When modeled as an exogenous relationship, the income effect is consistently positive, which suggests that satisfaction is simply a function of having more financial resources at hand. Persons with more money to spend are more content, at least with the financial aspects of their lives. But when modeled as an endogenous relationship, the net effect of income is consistently negative, small, and not always significantly different from zero, which suggests that the perceptual and evaluative processes ending in graded reports of satisfaction are more complex.

Since both model assumptions yield statistically significant parameter estimates, one might first ask about the choice between them. If answered strictly on the basis of model fit, the rule of parsimony would in this instance recommend the simpler model (i.e., the assumption of exogeneity). But that use of Ockham's rule is blind to the fact that we do have some guidance by theoretical expectations. Unless perceptual and evaluative states are not at all sensitive to specified status characteristics beyond their correlations with income, one should expect to see certain net effects of at least some of those status characteristics. For instance, consider two persons at the same (mean) income level, one whose income consists entirely of employment earnings and the other whose income consists of post-employment benefits such as a pension or investment returns. The former person should be more satisfied, or more likely satisfied, since he/she, still in the labor market, could more easily take steps to rectify an unsatisfactory level of income (Hazelrigg and Hardy 1997). Likewise, one should expect a significant positive net effect of being married (vs. widowed, single, or divorced/separated), since the presence of a spouse implies another avenue of behavioral change if household income is deemed unsatisfactory. Similar expectations pertain to other statuses, such as physical health. The estimations repeatedly demonstrated that the net effects of some statuses (e.g., health, age, being divorced/separated rather than married) are as expected regardless of the way the income effect is modeled. But for a number of statuses-employment, occupational

prestige, education, being married rather than widowed or single—the net effect is sensitive to the choice of model assumption, and the direction of the sensitivity argues in favor of the assumption of income endogeneity. The coefficient for employment status, for instance, is significant (and positive) only when income and satisfaction are modeled as jointly determined variables.

The gross effect of income is quite small, regardless of whether the observed or the instrumental variable is used. In bivariate regression, the coefficient (and standard error) for observed income is 1.638 (0.050), for the income instrument 1.517 (0.074). The respective R^2 values are 0.18 and 0.08. Evaluated at mean household income, predicted satisfaction is 6.6. The coefficient of 1.638 for observed income implies that an income twice the mean raises the satisfaction score slightly more than 1.6 units, to 8.2. The corresponding increment evaluated from the income instrument is slightly more than 1.5 units. Another perspective on the small magnitude of the income effect is afforded by converting from the log transform back to the observed metric. From distributional statistics we know that more than two-thirds of the households reported incomes between DM 15,000 and DM 61,000. The observed-income slope at DM 15,000 is 0.0001; at DM 61,000 it is .000027. In short, the gross effect of income on financial satisfaction is small at low incomes, and is increasingly smaller as we move up the income scale.

Note, however, that the bivariate specification that expresses satisfaction as a function of the income instrument allows other status characteristics to determine satisfaction only through the income instrument. As argued above, that restriction is contrary to theoretical expectation. Status variances not subsumed in the instrument should be, according to theory, significantly associated with satisfaction (net of the instrument). According to our estimations, they

are. Adding the vector of status variables (as in column 2) to the specification provides a much better fit ($R^2 = 0.24$, versus 0.08 for the bivariate); and adding the residual measure of relative standing improves the fit even more ($R^2 = 0.35$). But the net satisfaction effect of an increment in household income is not nearly as pronounced as the net satisfaction effect of several of the other status variables. Consider, for example, marital status. The predicted level of satisfaction for a 50-year-old German male household head with 12 years of schooling, employed in an occupation with a prestige score of 70, in very good health, and living in his own home with one other person would differ between 9.1 and 8.8, depending on whether his household income was DM 45,000 or DM 61,000 per year. If we compared this household head with a divorced household head who otherwise shared the same characteristics, including the same income of DM 45,000 per year, predicted satisfaction would differ between 9.1 (married) and 7.5 (divorced).

Finally, note the sign switch. Modeling the income effect as endogenous results in a switch from a small positive net effect of income to a small negative net effect. In that latter coefficient we are looking at the effect of status-predicted income on the variation in satisfaction not accounted for in the covariation of satisfaction with the vector of other status variables. Substantively, then, the negative sign means that household heads whose status-predicted household incomes are relatively high (low) tend to be less (more) satisfied than they „should” be in view of their income-implicated status characteristics. This cross-sectional pattern could be the result of a process that sorts *strivers* — heads of households that have been succeeding in income but want to succeed more — from *nonstrivers*. Taking a cross-section of that process at any given moment catches the strivers in relative dissatisfaction and the nonstrivers in relative satisfaction.

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